# USE OF BARRIERS WITH PITFALL TRAPS[1,2]

R. Marcel Reeves[3]

ABSTRACT: The addition of a plastic barrier between two pitfall traps was considered necessary to increase the recovery of marked *Calosoma frigidum* Kirby adults and to facilitate trap establishment in areas where rocks and tree roots were a problem. A three-container pitfall is described to help reduce mammal predation and increase serviceability.

The technique most often used for trapping ground surface crawling invertebrates has been pitfall traps. Their size, shape and construction material varies with the choice usually determined by the individual investigator. They have been used primarily as a survey or phenological tool or to determine relative numbers of insects present. However, their use for assessing absolute population levels has not been very satisfactory (Greenslade 1964; Luff 1975; Thomas and Sleeper 1977).

In a study of the caterpillar-hunter *Calosoma frigidum* Kirby it was necessary to establish large numbers of pitfall traps in a forest where rocks and roots were an important consideration. The behavior of adult *C. frigidum* when encountering an insurmountable object provided a solution. These adults tended to crawl along the edge of such a barrier rather than turning away from it. Why not use barriers to direct adult beetles toward a pitfall trap? Southwood (1966) suggested such an idea in his interceptor traps. The simplest design was to put 2 small pitfalls at either end of a long barrier. In this manner less disturbance of the forest floor was necessary, and at the same time increased efficiency was expected. The name most appropriate for this pitfall modification is "barrier-pitfall".

The following materials were used in the *C. frigidum* study for their durability and low cost. The barriers were plexiglass strips 3 feet (91.44 cm) long, 4-6 inches (10.16-15.24 cm) high, and 1/16-1/8 inch (0.16-.32 cm) thick. The pitfalls were polystyrene specimen containers. At first only a single container was used at each end of the barrier. To reduce predation by insectivorous mammals (racoons, chipmunks, skunks, mice, etc.), and to make specimen removal easier, a three-container system was developed. The outer container [32 ounce (946 ml) capacity, 4 3/4 inch (12.06 cm) diameter by 4 3/4 inch (12.06 cm) deep] remained undisturbed in the

[1]Received November 23, 1979

[2]Scientific Contribution No. 983 from the New Hampshire Agricultural Experiment Station.

[3]Department of Entomology, University of New Hampshire, Durham, New Hampshire 03824

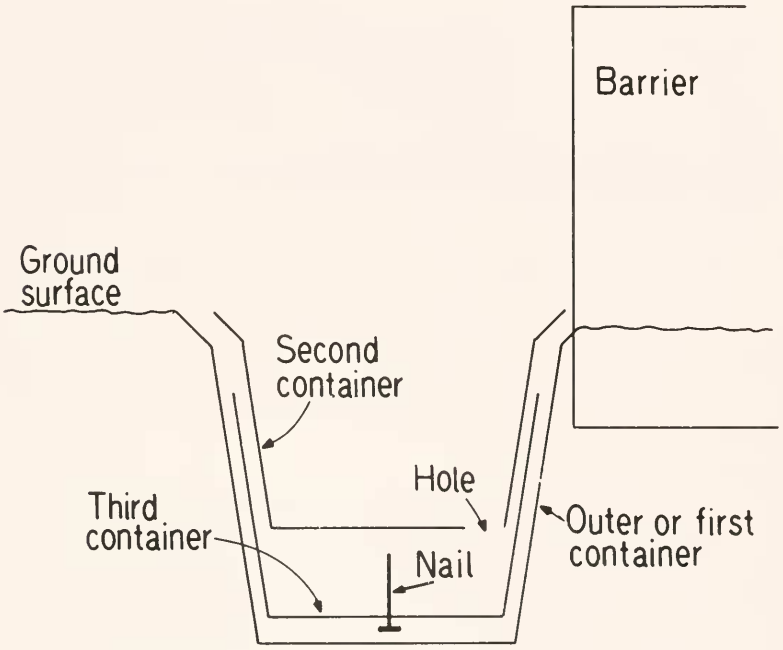


Figure 1. A three-container pitfall with adjacent barrier.

ground. A second container [16 ounce (473 ml) capacity, 4 5/8 inches (11.75 cm) diameter by 3 inches (4.62 cm) deep with a 3/4 inch (1.8 cm) hole cut in the bottom] was placed inside the first. The upper lip of this second container was just wide enough to prevent it from falling down inside the first. Insects falling into the second container would then drop down through the hole into the relatively protected space below. A third container, the same size as the second, had the rim or lip cut off so that it would slide down to the bottom of the first container and be flush at the sides. This served as a "basket" to lift specimens out. A nail pushed up through the bottom of this third container served as a handle to facilitate removal.

Drainage holes were punched in the lower 2 cups when live-trapping to prevent rain water from accumulating. No attempt was made to shield pitfalls from rain. If a preserving fluid was used only the third container or "basket" was provided with drainage holes. When used along banks of streams, rivers, lakes, etc., only a single pitfall, on the land end of the barrier, was necessary with the other end of the barrier extending into the water.

## LITERATURE CITED

Greenslade, P.I.M. 1964. Pitfall trapping as a method for studying populations of Carabidae (Coleoptera). J. Anim. Ecol. 33(2): 301-310.

Luff, M.L. 1975. Some factors influencing the efficiency of pitfall traps. Oecologia. 19(4): 345-357.

Southwood, T.R.E. 1966. Ecological methods. London, Methuen. 391 pp.

Thomas, D.B. and E.L. Sleeper. 1977. The use of pitfall traps for estimating the abundance of Arthropods with special reference to the Tenebrionidae (Coleoptera). Ann. Ent. Soc. Am. 80(2): 242-248.

# INTERNATIONAL COMMISSION ON ZOOLOGICAL NOMENCLATURE

c/o British Museum (Natural History),
Cromwell Road, London, SW7 5BD, United Kingdom.

1st November, 1979.

The Commission hereby gives six months notice of the possible use of its plenary powers in the following cases, published in *Bull. zool. Nom.* Volume 36, part 3, on 1st November 1979, and would welcome comments and advice on them from interested zoologists. Correspondence should be addressed to the Secretary at the above address.

2240 *Anaspis* Muller, 1764; *Luperus* Muller, 1764; *Lampyris* Muller, 1764; and *Clerus* Muller, 1764 (Insecta, Coleoptera): proposed designation of a type species.

2244 *Ptilium* Gyllenhal, 1827 and *Ptenidium* Erichson, 1845 (Insecta, Coleoptera): proposed conservation.

2246 *Chrysomela flavicornis* Suffrian, 1851 and *C. tibialis* Suffrian, 1851 (Insecta, Coleoptera): proposed conservation.

2146 *Rhodesiella plumigera* (Loew, 1860) (Insecta, Diptera): proposed suppression.

---

The following Opinions have been published recently by the International Commission on Zoological Nomenclature in the *Bulletin of Zoological Nomenclature*, Volume 36, part 3, 1 November, 1979.

1145 (p. 149) *Dryocoetes* Eichhoff, 1864 (Coleoptera, SCOLYTIDAE): conserved under the plenary powers.

1146 (p. 151) *Xyleborus* Eichoff, 1864 (Coleoptera, SCOLYTIDAE): conserved under the plenary powers.

The Commission regrets that it cannot supply separates of Opinions.